ATS Report#:413.62-12.159

Pacific Gas and Electric Company®

Applied Technology Services
3400 Crow Canyon Road
San Ramon, CA 94583

925.866.5203
Internal: 251.5203

Metallurgical Report

DATE: 23 AUGUST 2012

TO: SCOTT FANNIN

FROM: ANDREW CARR

SUBJECT: **1948/1956 30" L-132 SAN BRUNO PIPE CHEMISTRY**

Per your request, four (4) steel gas pipe segments from gas line 132[1] had coupon samples removed for chemical determination with verification that the pipe was not leaded (Pb) steel.

Coupons were extracted from two locations- base metal & weld bead- on each segment for chemistry, and sent to a third party independent laboratory for analysis. The four pipes were identified as:1948 1-1-S; 1948 1-3-S; 1956 1-1-N; 1956 1-3-S.

All four pipes were found to be typical carbon steel pipe within the chemistry ranges prescribed for gas pipe by API 5L. Lead (Pb) was specifically requested to be analyzed for and NO detectable Pb was found present in the base pipe metal or the corresponding weld bead.

Additionally, on each pipe segment a metallographic cross section of the weld was undertaken to document the weld seam type. All four pipe segments have DSAW type welds.

I have attached the full chemical analysis[2] and photos of the weld cross section for reference. Please contact me if you have questions regarding the testing or would like to further discuss this issue.

[1] Near location "1121 Glenview drive San Bruno, CA" per TD-4100-14-F01
[2] Anamet report# 5004.7819

pc: ATS records
SRFA

Prepared: WACB
Reviewed: DJT9

ATTACHMENTS

LABORATORY CERTIFICATE

Anamet, inc

August 24, 2012

LABORATORY NUMBER: 5004.7819 Rev. 1

CUSTOMER AUTHORIZATION: Credit Card

DATE SUBMITTED: August 16, 2012

REPORT TO: Pacific Gas & Electric Company
Attn: Andrew Carr
3400 Crow Canyon Road
San Ramon, CA 94583

SUBJECT:

Four sample lots were submitted for chemical analysis on the BM and WM and metallography. The samples were identified as L-132, 1948: M.P. 39.96, 1-3-S, 37.62370288, -122.44211211 and 39.36, 1-1-S, 37.62370288, -122.4421211; L-132, 1956: M.P. 39.36, 1-1-N and 1-3-S, 37.62369647, -122.44212152.

SPECTROCHEMICAL ANALYSIS:
(Reported as Wt. %)

Line 132, Base Metal		1948 1-1-S	1948 1-3-S	1956 1-1-N	1956 1-3-S
Carbon*	(C)	0.26	0.26	0.26	0.25
Chromium	(Cr)	0.01	0.01	0.01	0.01
Copper	(Cu)	0.05	0.05	0.07	0.07
Lead	(Pb)	<0.005	<0.005	<0.005	<0.005
Manganese	(Mn)	0.91	0.91	1.08	1.08
Molybdenum	(Mo)	<0.005	<0.005	<0.005	<0.005
Nickel	(Ni)	0.06	0.06	0.06	0.06
Phosphorus	(P)	0.019	0.019	0.024	0.025
Silicon	(Si)	0.04	0.04	0.07	0.07
Sulfur	(S)	0.023	0.025	0.026	0.029
Vanadium	(V)	<0.005	<0.005	<0.005	<0.005

* Determined by LECO combustion.

26102 Eden Landing Road, Suite 3, Hayward, California 94545-3811 Phone: **510-887-8811** Fax: **510-887-8427**

www.anametinc.com

Anamet, inc

Lab No. 5004.7819 Rev. 1

SPECTROCHEMICAL ANALYSIS:
(Reported as Wt. %)

Line 132, Weld Metal		1948 1-1-S	1948 1-3-S	1956 1-1-N	1956 1-3-S
Carbon	(C)	0.17	0.22	0.18	0.18
Chromium	(Cr)	0.03	0.22	0.03	0.03
Copper	(Cu)	0.10	0.15	0.10	0.10
Lead	(Pb)	<0.005	<0.005	<0.005	<0.005
Manganese	(Mn)	1.18	1.05	0.93	0.94
Molybdenum	(Mo)	0.01	0.05	<0.005	<0.005
Nickel	(Ni)	0.08	0.07	0.07	0.07
Phosphorus	(P)	0.023	0.027	0.020	0.020
Silicon	(Si)	0.11	0.17	0.36	0.36
Sulfur	(S)	0.024	0.025	0.028	0.028
Vanadium	(V)	<0.005	<0.005	0.01	0.01

MACROSCOPIC EXAMINATION

A cross section was removed from each weld. The section was polished, etched and photographed to show the general weld appearance. Photo-macrographs are attached as Figures 1 through 4.

This testing was completed on August 17, 2012 and was performed in accordance with the customer's authorization.

Submitted by:

Edward A. Foreman
Quality Manager

yv

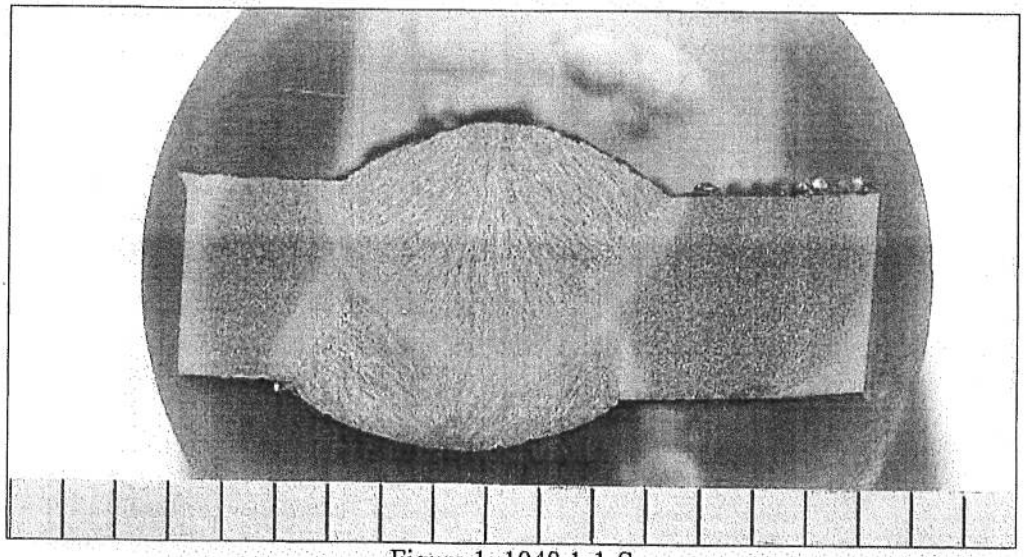

Figure 1: 1948 1-1-S
Scale = 0.1 in. / division

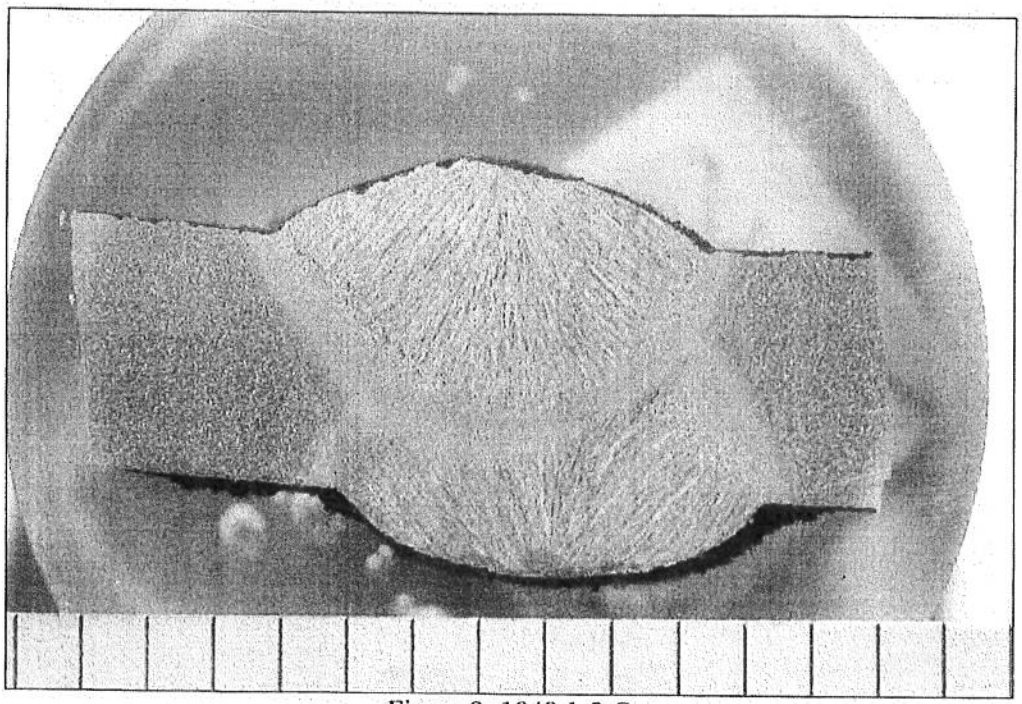

Figure 2: 1948 1-3-S
Scale = 0.1 in. / division

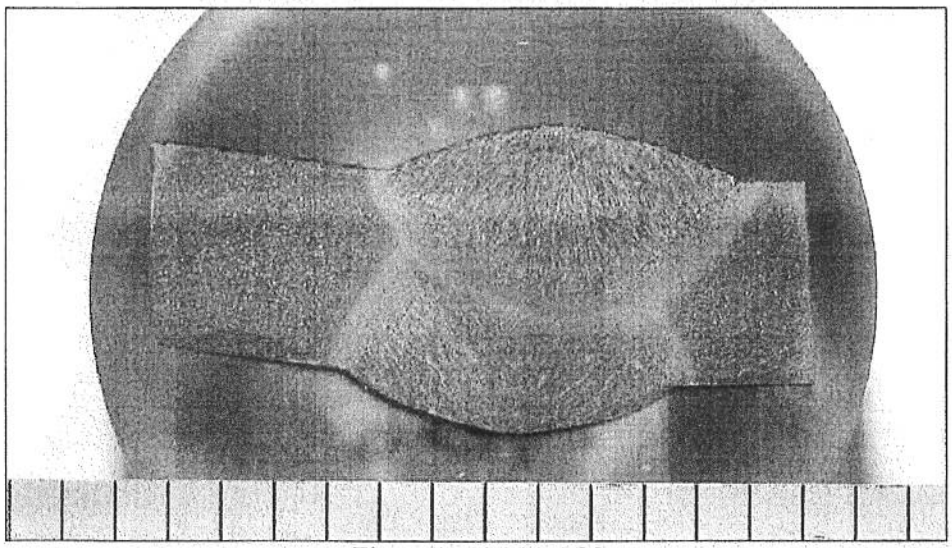

Figure 3: 1956 1-1-N
Scale = 0.1 in. / division

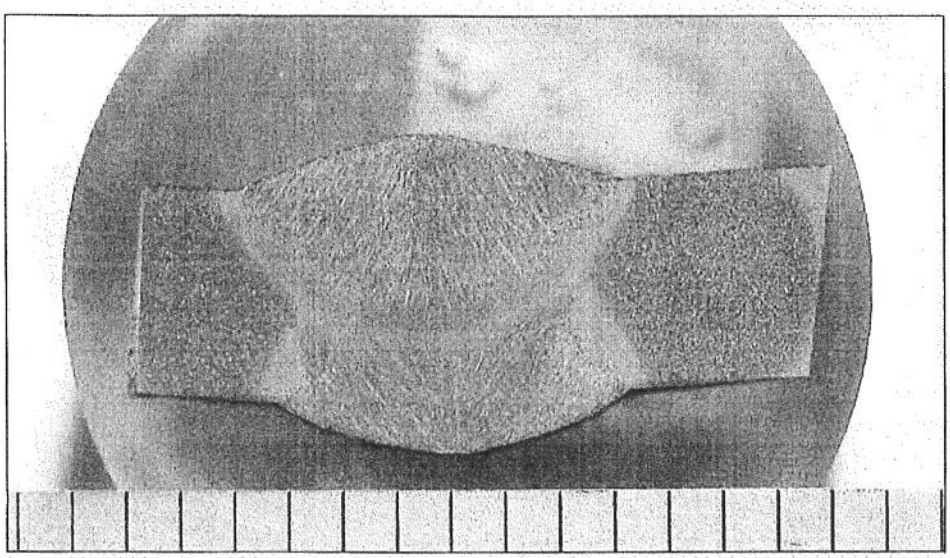

Figure 4: 1956 1-3-S
Scale = 0.1 in. / division